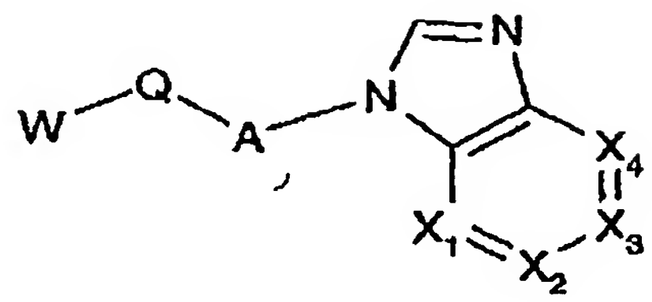
## CLAIMS

1. A compound of the general formula I

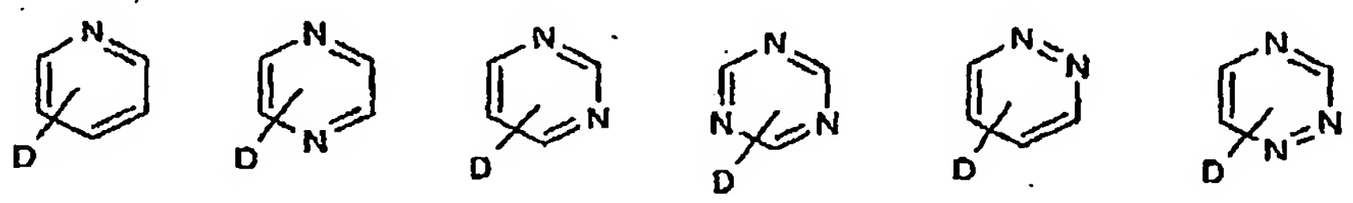


I

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereomers thereof, wherein:

$X_1$, $X_2$, $X_3$, $X_4$ are each carbon where one is substituted with Z and the rest independently with Y; or one of $X_1$, $X_2$, $X_3$, $X_4$ is N, and the others are carbon where one carbon is substituted with Z and the rest independently with Y;

A is a ring selected from:



where D is selected from H, $C_{1-4}$ alkyl, halogen, amino;

Q is a bond, halogen, $C_{1-4}$ alkyl, O, S, SO, $SO_2$, CO, CS;

W is:

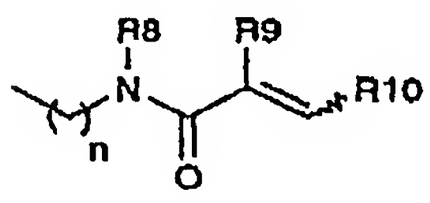
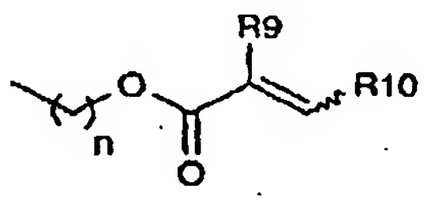
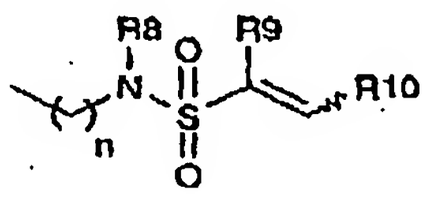
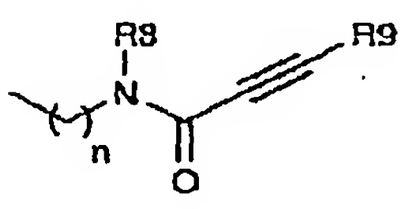
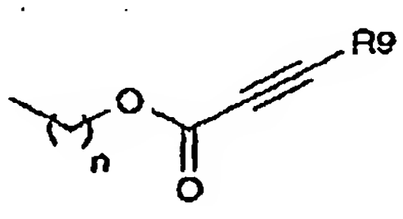
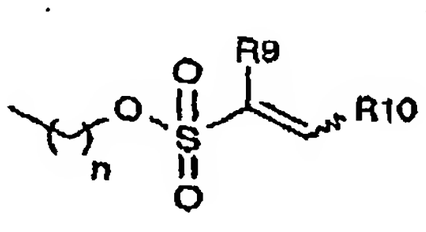
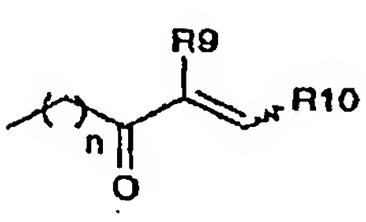
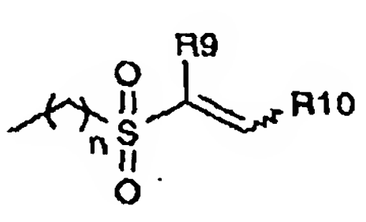
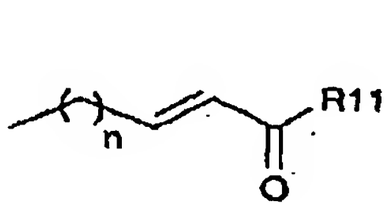
(ii) NR1R2 where R1 and R2 are independently H, $C_{1-4}$ alkyl, $C_{1-4}$ alkyl$CF_3$, aryl, hetaryl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl, $C_{3-8}$ cycloalkyl, $C_{2-6}$ alkenyl, cyclohetalkyl, $C_{1-4}$ alkylcycloalkyl, $C_{1-4}$ alkyl cyclohetalkyl, or R1 and R2 are joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR3; and R3 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{1-4}$ alkyl aryl, $C_{1-4}$ alkyl hetaryl, COR4 where R4 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl;

OR

(ii) H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{3-8}$ cycloalkyl, cyclohetalkyl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl, $C_{3-8}$ cycloalkyl, $C_{1-4}$ alkylcycloalkyl, $C_{1-4}$ alkyl cyclohetalkyl;

Y is H, halogen, CN, $CF_3$, nitro, OH, $C_{1-4}$ alkyl, $C_{1-4}$ alkylNR5R6, $C_{1-4}$ alkylhetaryl, $OC_{1-4}$ alkyl, $OC_{2-4}$ alkyl$OC_{1-4}$alkyl, $OC_{1-4}$ alkylNR5R6, $OC_{1-4}$ alkylhetaryl, $OC_{1-4}$ alkylcyclohetalkyl, $SC_{1-4}$ alkyl, $SC_{2-4}$ alkyl$OC_{1-4}$alkyl, $SC_{1-4}$ alkylNR5R6, NR5R6, NR5COR6, $NR5SO_2R6$; and R5 and R6 are each independently H, $C_{1-4}$ alkyl, or may be joined to form an optionally substituted 3-6 membered ring optionally containing an atom selected from O, S, NR7 and R7 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl;

Z is selected from :

where R8 is selected from H, $C_{1-4}$ alkyl;

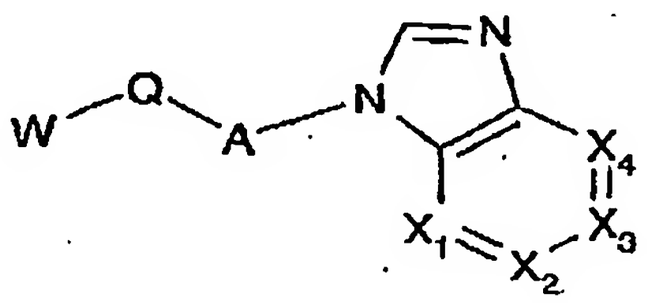
R9 and R10 are independently selected from H, $C_{1-4}$ alkyl, $C_{1-4}$ alkylNR12R13, $C_{1-4}$ alkyl$OR12$, $C_{1-4}$ alkylhetaryl or may be joined to form a 5-8 membered ring optionally containing an atom selected from O, S, SO, $SO_2$, NR14;

R11 is selected from OH, $OC_{1-4}$ alkyl, NR12R13;

n is 0-4;

where R12 and R13 are independently selected from H, $C_{1-4}$ alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR14; and R14 is selected from H, $C_{1-4}$ alkyl.

2. A compound according to claim 1 wherein the compound of formula I is a compound of formula II:

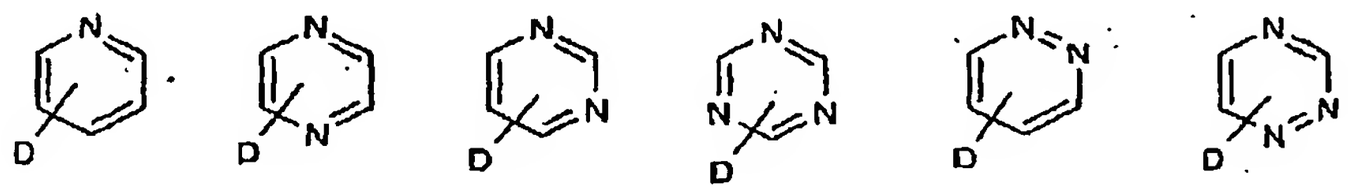


II

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereomers thereof, wherein:

$X_1$, $X_2$, $X_3$, $X_4$ are each carbon where one is substituted with Z and the rest independently with Y; or one of $X_1$, $X_2$, $X_3$, $X_4$ is N, and the others are carbon where one carbon is substituted with Z and the rest independently with Y;

A is a ring selected from:



where D is selected from H, $C_{1-4}$ alkyl, halogen, amino;

Q is a bond, halogen, $C_{1-4}$ alkyl, O, S, SO, $SO_2$, CO, CS;

W is:

(ii) NR1R2 where R1 and R2 are independently H, $C_{1-4}$ alkyl, $C_{1-4}$ alkyl$CF_3$, aryl, hetaryl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl, $C_{3-8}$ cycloalkyl, $C_{2-6}$ alkenyl, cyclohetalkyl, $C_{1-4}$ alkylcycloalkyl, $C_{1-4}$ alkyl cyclohetalkyl, or R1 and R2 are joined to form an optionally substituted 3-8 membered ring optionally

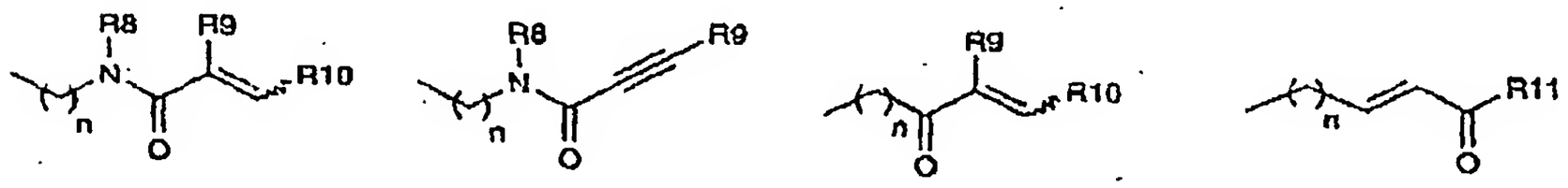
containing an atom selected from O, S, NR3; and R3 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{1-4}$ alkyl aryl, $C_{1-4}$ alkyl hetaryl, COR4 where R4 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl;

OR

(ii) W is H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{3-8}$ cycloalkyl, cyclohetalkyl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl, $C_{3-8}$ cycloalkyl, $C_{1-4}$ alkylcycloalkyl, $C_{1-4}$ alkyl cyclohetalkyl;

Y is H, halogen, CN, $CF_3$, nitro, OH, $C_{1-4}$ alkyl, $C_{1-4}$ alkylNR5R6, $C_{1-4}$ alkylhetaryl, $OC_{1-4}$ alkyl, $OC_{2-4}$ alkyl$OC_{1-4}$alkyl, $OC_{1-4}$ alkylNR5R6, $OC_{1-4}$ alkylhetaryl, $OC_{1-4}$ alkylcyclohetalkyl, $SC_{1-4}$ alkyl, $SC_{2-4}$ alkyl$OC_{1-4}$alkyl, $SC_{1-4}$ alkylNR5R6, NR5R6, NR5COR6, $NR5SO_2R6$; and R5 and R6 are each independently H, $C_{1-4}$ alkyl, or may be joined to form an optionally substituted 3-6 membered ring optionally containing an atom selected from O, S, NR7 and R7 is selected from H, $C_{1-4}$ alkyl, aryl, hetaryl, $C_{1-4}$ alkylaryl, $C_{1-4}$ alkylhetaryl;

Z is selected from :




where R8 is selected from H, $C_{1-4}$ alkyl;

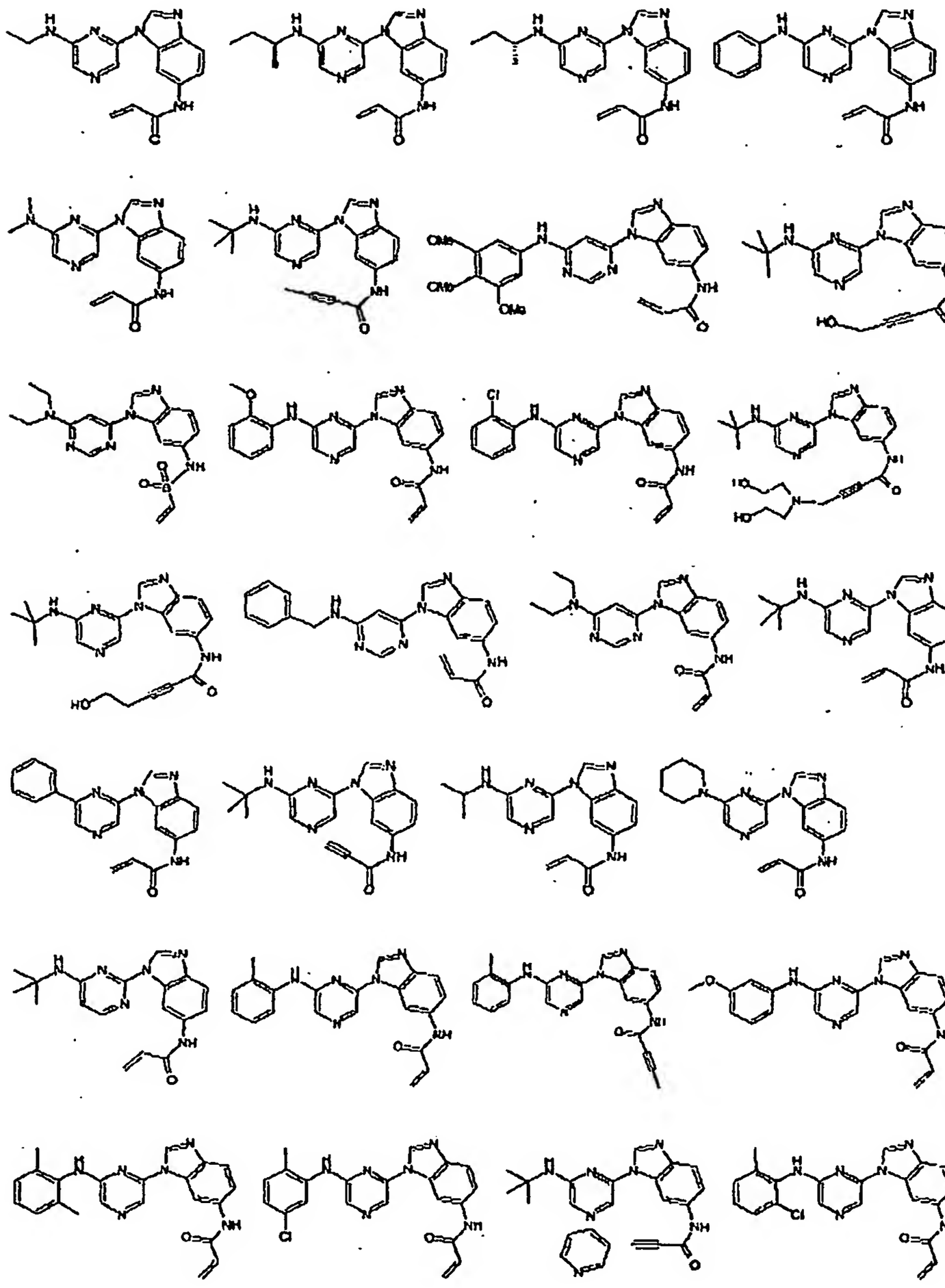
R9 and R10 are independently selected from H, $C_{1-4}$ alkyl, $C_{1-4}$ alkylNR12R13, $C_{1-4}$ alkylOR12, $C_{1-4}$ alkylhetaryl or may be joined to form a 5-8 membered ring optionally containing an atom selected from O, S, SO, $SO_2$, NR14;

R11 is selected from OH, $OC_{1-4}$ alkyl, NR12R13;

n is 0-4;

where: R12 and R13 are independently selected from H, $C_{1-4}$ alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR14; and R14 is selected from H, $C_{1-4}$ alkyl.

3. A compound according to claim 1 selected from the group consisting of:



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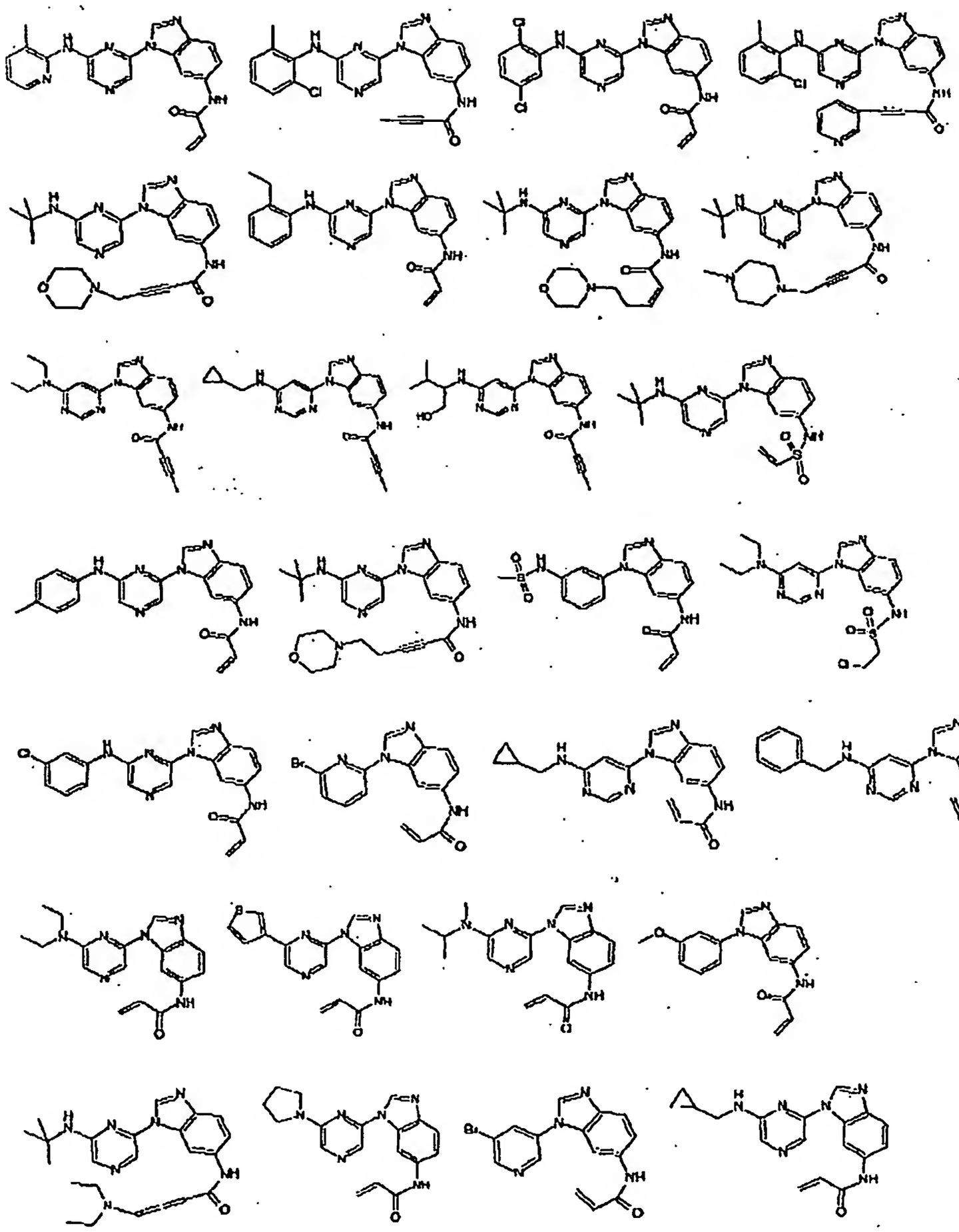

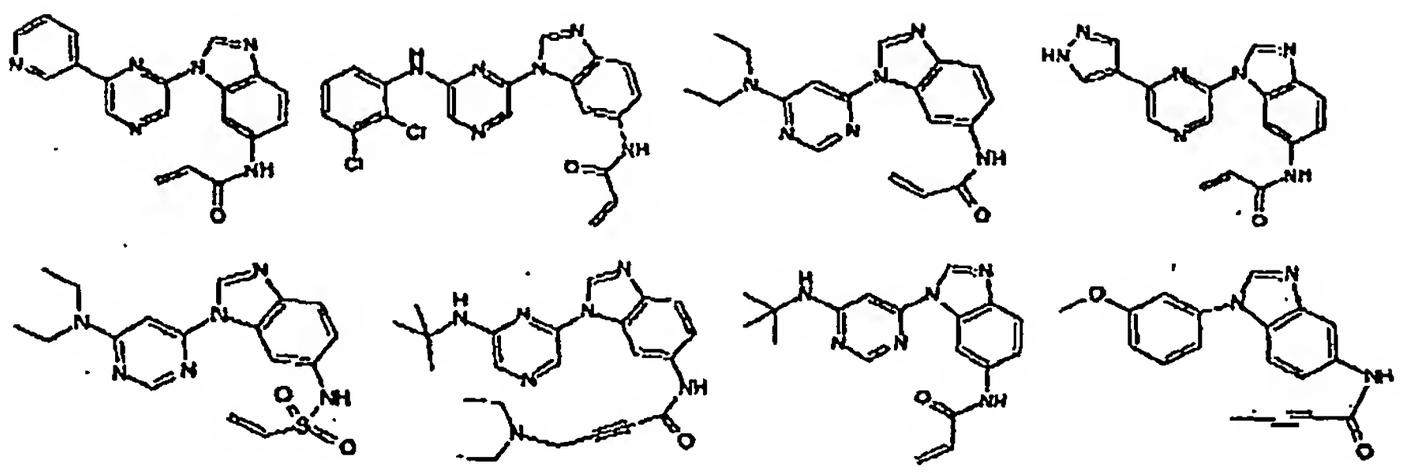

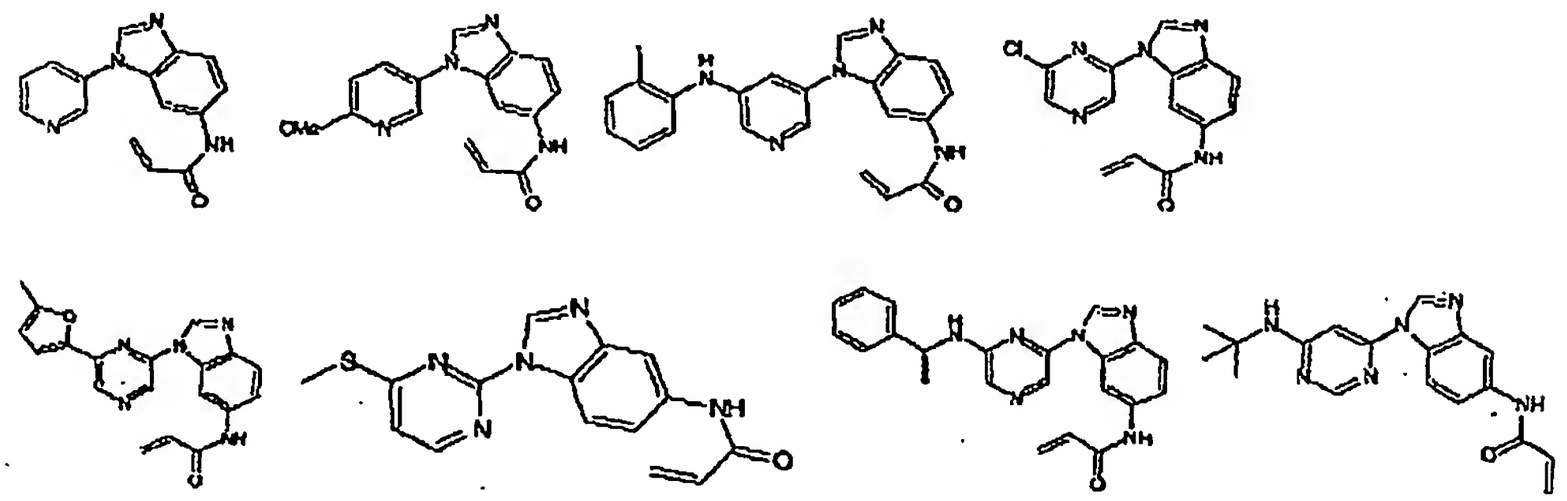

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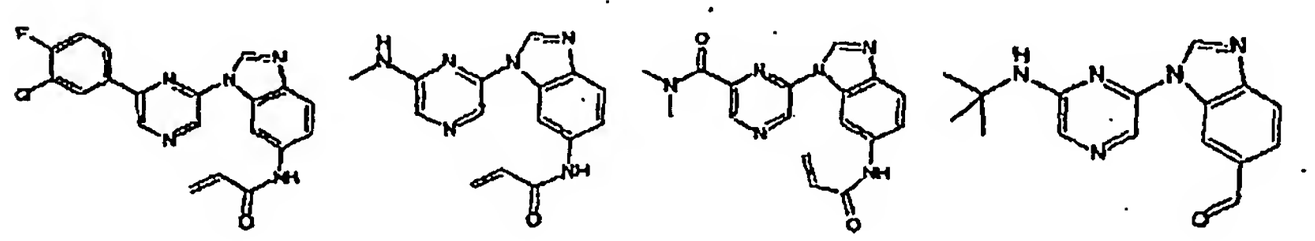

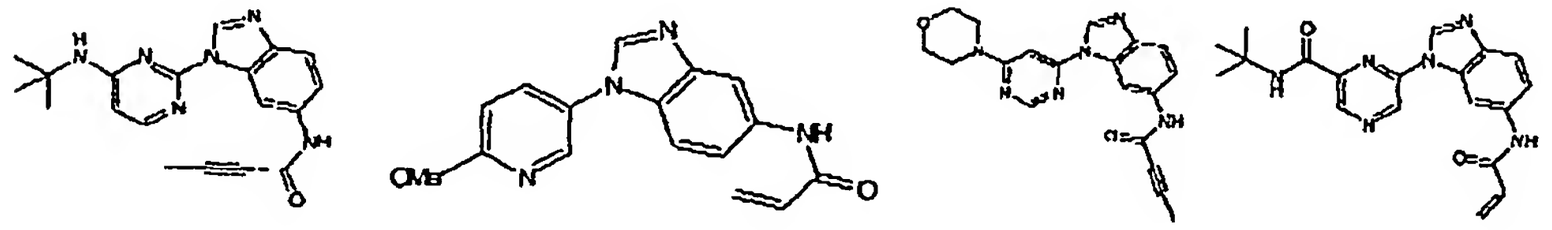

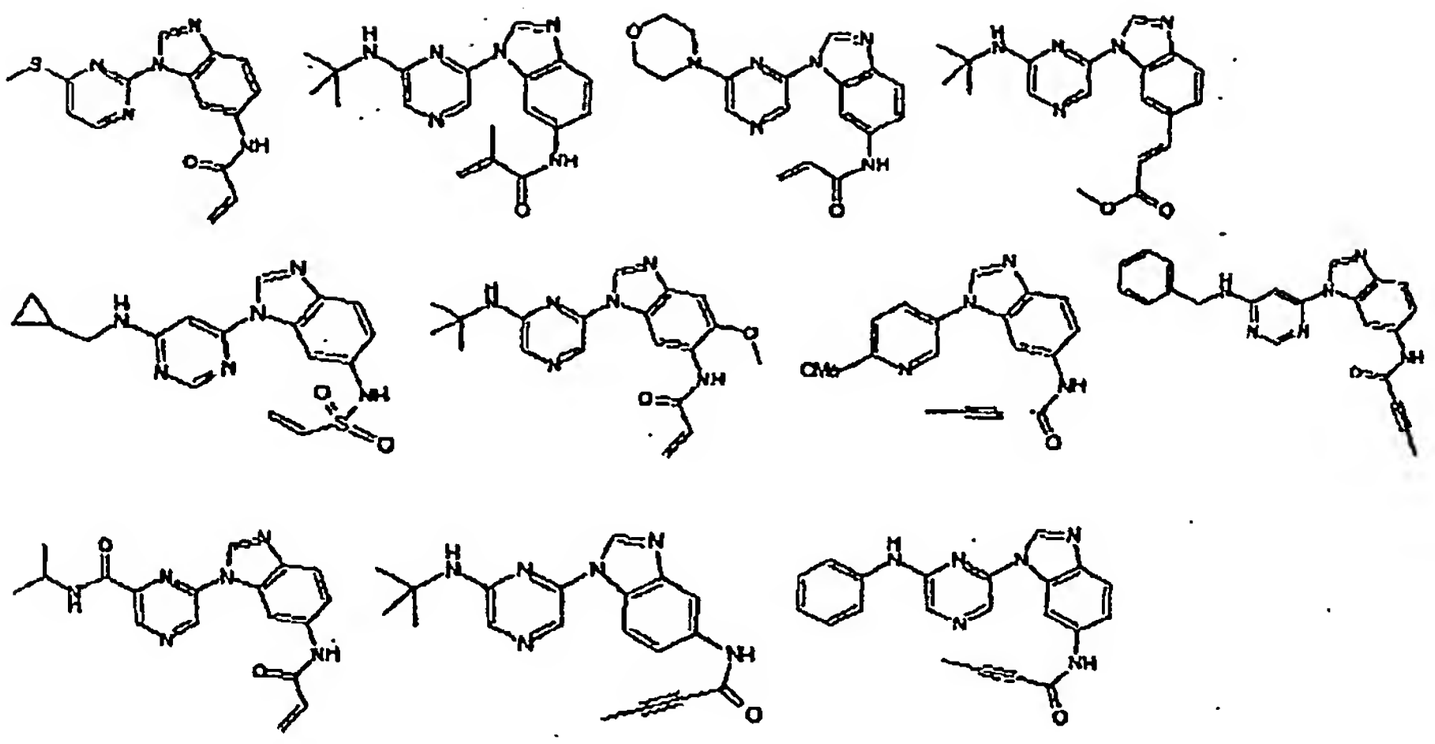

4. A compound according to any one of claims 1 to 3 wherein the compound irreversibly inhibits JAK-3.

5. A compound according to any one of claims 1 to 4 wherein the compound selectively inhibits JAK 3 with respect to JAK 1 or JAK 2.

6. A composition comprising a carrier and at least one compound according to any one of claims 1 to 5.

7. A method of treating a tyrosine kinase-associated disease state, the method comprising administering a therapeutically effective amount of at least one compound according to any one of claims 1 to 5 or a therapeutically effective amount of a composition according to claim 6.

8. Use of the compound according to any one of claims 1 to 5 or a composition according to claim 6 in the preparation of a medicament for the treatment of a JAK3-associated disease state.

9. A method of suppressing the immune system of a subject, the method comprising administering a therapeutically effective amount of at least one compound according to any one of claims 1 to 5 or a therapeutically effective amount of a composition according to claim 6.

## AMENDED CLAIMS

[received by the International Bureau on 17 May 2005(17.05.05);
new claims 10-13 have been added; claims 1-9 remain unchanged (1 page)].

10. A selective JAK 3 inhibitor comprising a functionality wherein the functionality is positioned to selectively interact with the Cysteine residue close to the front lip of the ATP-binding cavity of JAK3 (CYS909) whereby the inhibitor is selective for JAK3 with respect to JAK2 and JAK1.

11. A selective JAK3 inhibitor according to claim 10 wherein the functionality irreversibly binds with the Cysteine residue.

12. A selective JAK3 inhibitor according to claim 10 or claim 11 wherein the functionality is an alkylating group.

13. A selective JAK3 inhibitor according to any one of claims 10 to 12 wherein the functionality is a Michael acceptor.